



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,036	05/30/2006	Yoshito Shimizu	L9289.06162	6003

52989 7590 02/23/2010

Dickinson Wright PLLC
James E. Ledbetter, Esq.
International Square
1875 Eye Street, N.W., Suite 1200
Washington, DC 20006

EXAMINER

PHAM, TIMOTHY X

ART UNIT	PAPER NUMBER
----------	--------------

2617

MAIL DATE	DELIVERY MODE
-----------	---------------

02/23/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,036	Applicant(s) SHIMIZU ET AL.	
	Examiner TIMOTHY PHAM	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 11-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 11-12, 14-15, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simmons et al. (hereinafter "Simmons"; US 2004/0053586) in view of Anim-Appiah (US 2004/0100898; Cited in PTO-892 Part of Paper No. 20090522).

Regarding claims 11, 17, and 19, Simmons discloses a direct conversion reception apparatus , a direct conversion reception method, and a semiconductor integrated circuit apparatus for use in a system where transmit power varies between transmission signals by downlink transmit power control, comprising:

a reception quality measurement section that finds reception quality of a signal of a frame that is comprised of a plurality of time and has been received earlier, the reception quality being found on a per time slot basis slots (Fig. 5; paragraph [0046], e.g., For the purpose of clarity in FIG. 5, time spacing of DC estimates for both the inventive and prior art systems is assumed to be the same);

a gain control section (Fig. 4, reference 42, paragraphs [0036], [0043]) that selects a maximum gain in a same frame, from the gains of individual time slots estimated in the gain estimation section, and, using the gains of individual time slots, performs gain control during the reception period of the frame that is going to be received, on a per time slot basis (paragraphs [0043], [0060], e.g., the gain control 42 determines that the high amplitude of the received signal necessitates a gain change to a much lower value); and

a voltage calibration section (Fig. 4, reference 46) that calibrates an offset voltage of the signal of the frame that is going to be received, on a per frame basis, before the reception period of the frame that is going to be received, using a calibration value matching the maximum gain selected in the gain control section (paragraphs [0042], [0050], e.g., The DC offset correction functional block 46 uses the DC offset estimates generated by the estimator 44 to correct for the DC offset present in the received signal).

Simmons fails to specifically disclose a gain estimation section that estimates, based on the reception quality of individual time slots found in the reception quality measurement section, gains for amplifying a signal of a frame that is going to be received, to a predetermined reference value, before a reception period of the signal that is going to be received, the gains being estimated on a per time slot basis.

However, Anim-Appiah discloses a gain estimation section (Abstract; paragraph [0013]) that estimates, based on the reception quality of individual time slots found in the reception quality measurement section, gains for amplifying a signal of a frame that is going to be received, to a predetermined reference value, before a reception period of the signal that is going to be received, the gains being estimated on a per time slot basis (paragraphs [0013], [0015],

Art Unit: 2617

[0017], [0020], [0028], [0031], [0034], [0036], [0045], e.g., The RF processor couples to the baseband processor to receive the variable gain control setting V_{AGC} during the processing the preamble of each packet to provide a partially demodulated signal $y(t)$ of constant energy. Further, the baseband processor calculates the gain estimation h_i of each sub-channel and calculates the noise-plus-interference power P_{ni}).

Therefore, taking the teachings of Simmons in combination of Anim-Appiah as a whole, it would have been obvious to one having ordinary skill in the art at the time of the invention by applicant to estimate gains for amplifying a signal in order to maintain output power over a wide input dynamic range.

Regarding claims 12, 18, and 20, Simmons in combination with Anim-Appiah discloses the reception apparatus, the direct conversion reception method, and the semiconductor integrated circuit apparatus in a direct conversion reception apparatus according to claims 11, 17, and 19 respectively, wherein:

the reception quality measurement section (Anim-Appiah: Fig. 1, reference 134) finds a reception field intensity that serves as a control reference in transmit power control for time slots, from the reception quality of individual time slots (Anim-Appiah: paragraph [0028], [0034]); and

the gain estimation section estimates the reception field intensities of individual time slots of the frame that is going to be received ((Anim-Appiah: paragraphs [0031], [0034], [0036], [0039], e.g., baseband processor 116 measures the power of the signal received, calculates the gain estimation), from the reception field intensity and transmit power information of individual time slots of the frame that has been received earlier, the transmit power information being included in demodulated data of the frame that has been received earlier, and estimates the gains

Art Unit: 2617

of individual time slots according to the reception field intensities of the time slots of the frame that is going to be received (Anim-Appiah: paragraphs [0030]-[0031], [0034], note that the signal $y(t)$ is sampled and quantized to yield the discrete time).

Therefore, taking the teachings of Simmons in combination of Anim-Appiah as a whole, it would have been obvious to one having ordinary skill in the art at the time of the invention by applicant to the reception quality measurement section finds a reception field intensity that serves as a control reference in transmit power control for time slots, from the reception quality of individual time slots; and the gain estimation section estimates the reception field intensities of individual time slots of the frame that is going to be received, from the reception field intensity and transmit power information of individual time slots of the frame that has been received earlier, the transmit power information being included in demodulated data of the frame that has been received earlier, and estimates the gains of individual time slots according to the reception field intensities of the time slots of the frame that is going to be received for advantages of implementing the analog to digital converter.

Regarding claim 14, Simmons in combination with Anim-Appiah discloses the reception apparatus according to claim 11, wherein, when a difference between a maximum gain among the gains of individual time slots in a reception period of the frame that has been received earlier, and a minimum gain among the gains of individual time slots in the reception period of the frame that has been received earlier, is equal to or greater than a threshold, the gain estimation section estimates the gains of individual time slots of the frame that is going to be received, by excluding a measurement value of the time slot of the minimum gain (Simmons: paragraph [0038], e.g., Conventional AGC algorithms normally assign minimum and maximum gains depending upon

Art Unit: 2617

the desired receiver and ADC dynamic ranges and provide for gain steps between the minimum and maximum values. The gain step size is typically relatively small (less than 3 dB) to provide an approximation to a "continuous" AGC transfer function).

Regarding claim 15, Simmons in combination with Anim-Appiah discloses the reception apparatus according to claim 12, wherein the gain estimation section subtracts increment and decrement values of transmit power indicated in the transmit power information from the reception field intensity on a per time slot basis (Anim-Appiah: paragraph [0019]) and estimates transmit powers of individual time slots (Simmons: paragraphs [0048], [0053], e.g., The current estimate is used to correct the scaled signal for DC offset), and estimates the gains of individual time slots for amplifying a received signal of an estimated transmit power to the predetermined reference value (Anim-Appiah: paragraph [0019]; claim 11, note equation [3]).

Therefore, taking the teachings of Simmons in combination of Anim-Appiah as a whole, it would have been obvious to one having ordinary skill in the art at the time of the invention by applicant to subtract increment and decrement values of transmit power indicated in the transmit power information from the reception field intensity on a per time slot basis and to estimate the gains of individual time slots for amplifying a received signal of an estimated transmit power to the predetermined reference value for advantages of controlling output power saturation which occurs between each amplification.

4. Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simmons in combination with Anim-Appiah in view of Allott et al. (hereinafter "Allott"; US 2002/0160738).

Regarding claim 13, of Simmons in combination with Anim-Appiah discloses the reception apparatus according to claim 11, fails to specifically disclose wherein, when a difference between an average gain of the gains of individual time slots in a reception period of the frame that has been received earlier, and a minimum gain among the gains of individual time slots in the reception period of the frame that has been received earlier, is equal to or greater than a threshold, the gain estimation section estimates the gains of individual time slots of the frame that is going to be received, by excluding a measurement value of the time slot of the minimum gain.

However, Allott discloses when a difference between an average gain of the gains of individual time slots in a reception period of the frame that has been received earlier, and a minimum gain among the gains of individual time slots in the reception period of the frame that has been received earlier, is equal to or greater than a threshold, the gain estimation section estimates the gains of individual time slots of the frame that is going to be received, by excluding a measurement value of the time slot of the minimum gain (paragraphs [0013], [0031], [0043]).

Therefore, taking the teachings of Simmons in combination of Anim-Appiah as a whole, it would have been obvious to one having ordinary skill in the art at the time of the invention by applicant to set a gain when a difference between an average gain of the gains of individual time slots in a reception period of the frame that has been received earlier, and a minimum gain among the gains of individual time slots in the reception period of the frame that has been received earlier, is equal to or greater than a threshold, the gain estimation section estimates the gains of individual time slots of the frame that is going to be received, by excluding a

Art Unit: 2617

measurement value of the time slot of the minimum gain for advantages of controlling output power saturation which occurs between each amplification.

Regarding claim 16, Simmons in combination with Anim-Appiah discloses the reception apparatus according to claim 12, wherein:

the gain control section performs gain control of the received signal on a per stage basis in the reception period of the frame that is going to be received, using the gains of individual stages set in the gain estimation section (Simmons: paragraph [0041], [0043], [0054], e.g., the gain control 42 determines that the high amplitude of the received signal necessitates a gain change to a much lower value, for example the lowest gain corresponding to gain setting AGC7. The new gain setting AGC7 is provided to both the DAC 36 to effect the gain change at gain stage 16 and to the RAM 38 to access the gain setting/estimate table).

Simmons in combination with Anim-Appiah fails to specifically disclose the gain estimation section sequentially sets the gains for amplifying a received signal to the predetermined reference value through a plurality of stages, in the reception period of the frame that is going to be received, on a per stage basis, such that a gain in an earlier stage in the plurality of stages is equal to or greater than a gain in a later stage.

However, Allott discloses the gain estimation section sequentially sets the gains for amplifying a received signal to the predetermined reference value through a plurality of stages (paragraphs [0012], [0024], [0028]), in the reception period of the frame that is going to be received, on a per stage basis, such that a gain in an earlier stage in the plurality of stages is equal to or greater than a gain in a later stage (paragraphs [0012], [0031]-[0032]).

Art Unit: 2617

Therefore, taking the teachings of Simmons in combination of Anim-Appiah and Allott as a whole, it would have been obvious to one having ordinary skill in the art at the time of the invention by applicant to have the gain estimation section sequentially sets the gains for amplifying a received signal to the predetermined reference value through a plurality of stages, such that a gain in an earlier stage in the plurality of stages is equal to or greater than a gain in a later stage for advantages of providing increased input resistance, reduced output resistance, increased gain, and increased power handling capability.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY PHAM whose telephone number is (571)270-7115. The examiner can normally be reached on Monday-Friday; 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vincent P. Harper can be reached on 571-272-7605. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Timothy Pham/
Examiner, Art Unit 2617

/VINCENT P. HARPER/
Supervisory Patent Examiner, Art Unit
2617